CHARGING AND AUDIO USAGE

FIELD

[0001] The subject matter described herein relates to wireless devices.

BACKGROUND

[0002] Physical connectors, such as the connector used with the Universal Serial Bus (USB), can be used to couple devices. USB standards define physical and electrical aspects of USB. Examples of those standards include Universal Serial Bus 3.1 Specification and Universal Serial Bus 3.0 Specification, as well as any additions, revisions, and updates thereto.

SUMMARY

[0003] Methods and apparatus, including computer program products, are provided for charging and audio usage.

[0004] In some example embodiments, there is provided a method. The method may include detecting, by an accessory including a first connector and a second connector configured to enable coupling to a user equipment, a charger being coupled to the first connector; sending, based on at least the detected charger, an indication to the user equipment to change to a power receive mode; detecting, by the accessory, the change to the power receive mode; and allowing, based on at least the detected change, power to flow from the first connector to the second connector.

[0005] In some variations, one or more of the features disclosed herein including the following features can optionally be included in any feasible combination. The indication may include a message sent by the accessory via a digital interface of the accessory. The detected power receive mode change may include receiving another message from the digital interface of the accessory, wherein the other message indicates a change in power mode. The allowing may further include closing a switch to allow the power to flow from the first connector coupled to the charger to the second connector coupled to the user equipment. The accessory may detect a loss of power provided by the charger. Another indication to the user equipment may be sent to change to a power source mode based on at least the detected power loss. The switch may be opened to disable a connection to the charger and to allow the user equipment to supply power to the accessory via the second connector. The at least one diode may be coupled to the second connector and the switch to prevent a current flow from a capacitor to the second connector and the coupled user equipment, wherein the capacitor may provide a momentary source of power to the accessory when the loss of power from the charger occurs. The accessory may include a headset. The first connector and the second connector may include a universal serial bus connector, a Micro-B connector, a Type C connector, a dedicated charging connector, or a combination thereof.

[0006] The above-noted aspects and features may be implemented in systems, apparatus, methods, and/or articles depending on the desired configuration. The details of one or more variations of the subject matter described herein are set forth in the accompanying drawings and the description below. Features and advantages of the subject matter described herein will be apparent from the description and drawings, and from the claims.

DESCRIPTION OF THE DRAWINGS

[0007] In the drawings,

[0008] FIG. **1** depicts an example of an accessory, such as a headset in accordance with some example embodiments;

[0009] FIG. **2**A depicts an example of a system including a headset with two connectors, in accordance with some example embodiments;

[0010] FIG. **2**B depicts an example of a headset including two connectors, in accordance with some example embodiments;

[0011] FIGS. **3** and **4** depict examples of processes for use at a headset including two connectors, in accordance with some example embodiments.

[0012] FIGS. **5** and **6** depict examples of configurations of the system of FIG. **2**A, in accordance with some example embodiments; and

[0013] FIG. **7** depicts an example of a user equipment, in accordance with some example embodiments.

[0014] Like labels are used to refer to same or similar items in the drawings.

DETAILED DESCRIPTION

[0015] FIG. **1** depicts an example of an accessory device, such as an audio headset device **199**. The headset **199** may include a data connector **100**, in accordance with some example embodiments. The connector **100** may, in some example embodiments, include a single, small-sized connector, such as a universal serial bus (USB) connector configured in accordance with USB 3.0, USB 3.1, and any subsequent revisions and updates thereto, that may have a symmetrical design which can be swapped, so that an end-user does not need to be concerned with whether the connector is connected to a host device or a slave device or the way the connector plug is inserted into a receptacle. For example, USB connector **100** may be a plug at a headset device **199**. When headset **199** couples USB connector **100** into a user equipment, the headset **199** may obtain power and/or audio from the user equipment via the USB connector **100**.

[0016] The headset **199** may include a voltage bus **102** and a power regulator **104** for regulating supplied power (labeled Vcc). The headset **199** may include one or more user interfaces, such as one or more speakers/earphones **106**, one or more microphones **108**, one or more switches (or control mechanisms), light emitting diodes **112**, and the like coupled to audio and control circuitry **107**. The user interfaces may receive via audio and control circuitry **107** a signal input **114** (for example, an audio signal, control, and the like) and a clock **116**. The user interfaces may also provide an output signal **118** (for example, audio out, control, and the like). The signal input **114**, clock **116**, and output signal **118** may be coupled to connector **100**. For example, signal input **114** may couple to pin **120**A (labeled RFU), clock signal **116** may couple to a configuration channel (CC**2**) pin **120**B, and output signal **118** may couple to pin **120**C (labeled RFU), although other connection configurations may be used as well. In the example of FIG. **1**, USB connector **100** may represent a USB Type C plug, in which RFU pins **120**A and **120**B may be reserved for future use. FIG. **1** also shows a load resistor **122** coupled to configuration channel pin **120**D.

[0017] In the example of FIG. **1**, headset **199** may be used to listen and/or speak during a call at a user equipment. However, if the user equipment's USB connector receptacle is coupled to headset **199** via plug connector **100**, the user